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OPERATIVE TREATMENT  
OF  
Strictures of the Male Urethra.

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OPERATIVE TREATMENT  
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STRICTURES OF THE MALE URETHRA.

BEFORE describing the treatment of strictures of the male urethra, I think it well to mention their classification and location.

The usual classification of strictures are as follows :

1. The linear, bridle, pack thread, or valvular.
2. The annular.
3. The irritable.
4. The resilient.
5. The stricture of large calibre.
6. The stricture of small calibre.

Strictures are also spoken of as permeable and impermeable, depending upon the degree of contraction ; permeable when an instrument can be passed through the stricture, and impermeable when the stricture will not permit the passage of an instrument, let it be ever so small.

*Location.*—There has been a great deal of discussion as to the location of strictures of



the urethra. Sir Henry Thompson, Treves, and Keys believe that the most frequent seat of stricture (two-thirds) is beneath the sub-pubic arch or at the bulbo-membranous junction. Dr. Otis claims that the most frequent seat of stricture is about one-quarter of an inch within the meatus urinarius. In my experience the majority of strictures occur about the middle of the pendulous urethra.

The operations for stricture of the male urethra aiming for a radical cure, in my judgment, are gradual dilatation, only practised as a preliminary procedure to dilating internal urethrotomy, external urethrotomy, and a combination of dilating internal urethrotomy and external urethrotomy.

In determining the operative treatment, I first learn the position of the stricture or strictures; and, secondly, their calibre, this being most accurately as well as conveniently accomplished by the urethral metre. All strictures of large calibre, by which I mean those of eighteen millimetres and over in circumference, when situated not deeper than four and a half inches within the meatus urinarius in the average-sized penis, and five inches in the unusually large penis, are cases for dilating internal urethrotomy.

Strictures impermeable to the passage of instruments (filiform bougies, etc.) are cases for external urethrotomy or perineal section, depending upon their location. Strictures of small calibre, which cannot be dilated to eighteen millimetres by gradual dilatation, and situated within four and a half inches of the meatus urinarius in the average-sized penis and five inches in the unusually large penis,

are cases for internal urethrotomy, first using Maisonneuve's urethrotome, with which the stricture or strictures are cut to twenty millimetres, when, with the dilating urethrotome, the calibre of the urethra is easily restored.

Gradual dilatation, by means of conical steel bougies, is the form of treatment most commonly employed by the great majority of surgeons, and for what reason I know not, but hope it is because their patients will not submit to more radical measures, urethrotomy, which beyond any question of doubt, offers the only means of cure. It is true that gradual dilatation will temporarily relieve a stricture, but where is there a surgeon who would promise a cure by this treatment? Except, perhaps, I will venture to say, in very recent strictures, as before organization has taken place: but these are so seldom seen before this process is complete, not having been the occasion of sufficient trouble to prompt the patient to seek the advice of a surgeon; therefore they can practically be dismissed. With this form of treatment, the bougie becomes the patient's constant companion, not for a short time, but for life. How common it is for the patient to be prescribed a bougie, and with one or two lessons taught how to use it, and is advised to pass it himself once every week, or perhaps every other week; this, to say nothing of the ill effect accruing from this treatment, is quite enough to condemn it. Many of us have seen epididymitis, cystitis, abscess of the prostate, and prostatorrhœa, resulting from the passage of the bougie, both in the hands of the surgeon and of the patient. None of

these troubles have I ever seen follow an internal or external urethrotomy properly done. We will admit that in nearly all cases of stricture treated by gradual dilatation, whether the stricture be in the pendulous urethra or further back, the bougie is passed into the bladder ; in fact, the instrument is forced into the urethra up to its hilt by depressing the handle well between the thighs, and is not spoken of as dangerous treatment when compared with urethrotomy. The mediate danger of this manner of treatment I am very certain is of considerable moment, while that of urethrotomy is *nil*.

There is no doubt that with a very small conical steel sound, unless the greatest care be observed when attempting to traverse a tight stricture, there is danger of making a false passage, this being more likely to occur when the stricture is located in the pendulous than in the deep urethra. To some this may seem an adverse statement, but when we recall the fact that the surgeon has better command of the deep than of the pendulous urethra, owing to the relation it bears to the anterior wall of the rectum, with the index-finger, in which (for practical purposes answering the part of a director) it can be positively determined whether or not the sound is following the proper course, it will be readily understood. I am always able to accomplish more with the conical steel sound than with the soft bougie. If from the history and examination of a case like the above I suspect there is a false passage, I make a urethroscopic examination, when, with a probe, I am able to determine positively. It

may be very difficult to find the orifice of the false passage, owing to the presence of blood ; this can be overcome by swabbing the urethra with styptic cotton.

Continuous dilatation, where a filiform bougie or a small catheter, if the stricture will admit it, is introduced into the bladder, and allowed to remain for some time; generally two or three days, when these are replaced by others of larger size, and so on till the stricture can be disposed of according to the operator's preference,—this treatment is always followed by a strong tendency to re-contraction, to say nothing of its provoking suppuration and often ulceration of the walls of the urethra ; certainly three strong objections. In the case of a tight stricture of the deep urethra (causing retention of urine) in a subject well advanced in years, and having every appearance of bladder- and kidney-disease, I have seen the urethra loaded with filiform bougies, and, after persevering for some time, the surgeon has succeeded in passing one through the stricture, allowing it to remain, congratulating himself upon the feat performed, this offering sufficient relief to the distended bladder till the stricture can be dilated to admit the smallest-sized catheter. By this treatment it is a question how long it will be before the bladder is completely emptied, to say nothing of the evil effects of the prolonged retention. These are cases in which I always practise and teach that external urethrotomy should be done, thus fulfilling every indication,—that of relieving the retention, dividing the stricture, and draining the bladder, all of which are

urgently called for, but especially so, in the event of existing organic trouble, beyond the urethra.

The treatment by rapid dilatation and divulsion I do not approve of, as by either means we must necessarily occasion a lacerated wound, the latter being much less safe than an incised wound, like that made in the operation of internal urethrotomy. In operations upon the surface of the body, we are careful to have our cutting instruments in such condition as not to do faulty work, knowing how union is interfered with when the edges of the wound are in any way confused or lacerated. Why, then, should we adopt an opposite course when doing a plastic operation, as it were, upon the urethra, to say nothing of opening up more than one channel by which the urine may find its way by infiltration, thus exposing the patient to unwarrantable risk? For one who still believes the above means of treating strictures of the urethra are preferable, safer, and therefore more surgical than by internal urethrotomy, to convince him he is wrong, I would ask him that he make a urethroscopic examination, with the incandescent lamp urethroscope (Leiter), of the portion of the urethra operated upon, when I am confident that this alone would forever disabuse his mind of the fallacy he has been laboring under, if not instilling into the minds of hundreds of medical students, to say nothing of the sequelæ of the divulsion treatment. In a paper on the "Value of the Leiter Incandescent Lamp Urethroscope in the Treatment and Diagnosis of Chronic Urethral Discharges," I had the

honor of reading before the surgical section of the American Medical Association, at Nashville, Tenn., May, 1890, and published in the *Philadelphia Medical News* of June 21, 1890, I called attention to the disadvantage of this proceeding, illustrating my remarks by diagrams, which showed tabs of the torn urethra. The only circumstances under which I practise rapid dilatation or divulsion, but never carried to the extent of restoring the urethra at the seat of the stricture to its normal calibre, are when called to see a patient with a stricture, simple or multiple, of small calibre, seated in either pendulous or deep urethra, causing retention of urine, and when a cutting operation is positively refused. Here I introduce the small-sized Thomson divulsor, if the stricture or strictures will admit it, and stretch it to thirty millimetres. Not being able to engage a divulsor at once, I introduce a filiform bougie, and over this pass the divulsor. Immediately after the divulsion, a No. 20 soft catheter rendered aseptic is passed into the bladder, and retained for forty-eight hours. The bladder is washed out through the retained catheter with either boracic-acid solution or a solution of bichloride of mercury, 1 to 15,000, two or three times a day, depending upon the amount of cystitis present. The retention of a catheter in cases like the above I consider imperative. The treatment by internal urethrotomy is carried out in the following manner: The preparatory treatment consists in an examination of the urine, both chemically and microscopically, when, if the case be a suitable one for operation, the internal admin-

istration of boracic acid, 10 grains, is given four times daily; attention to the bowels, a laxative being given, if necessary; irrigation of the urethra with a 1 to 15,000 solution of bichloride of mercury three times daily; this to be instituted and pursued for four days previous to the operation.

The technique of the operation is described in the report of the cases. The after-treatment consists in the internal administration of boracic acid and two grains of bisulphate of quinine four times daily for three or four days; urethral injections of either boracic acid, grains 5, to 1 ounce of distilled water, or solution of bichloride of mercury, 1 to 15,000, for one week, when, if there is still present some discharge, the urethra is examined urethroscopically, and treatment directed according to the indications. The passage of a bougie of the calibre of the urethra at intervals of four days is continued for four weeks. The complications of internal urethrotomy usually described are hemorrhage, extravasation of urine, urethral fever, spongio-corporitis, and abscess of the prostate. If the rules relative to the distance from the meatus in the division of strictures by internal urethrotomy be closely observed, and the retention of a full-sized aseptic soft rubber catheter in the bladder for twenty-four hours after the operation and the division made with the dilating urethrotome, hemorrhage to any extent should not occur. The superiority of the dilating urethrotome over Civiale's instrument, the one so largely used, and all others of this class, a point which will be referred to later on, is the

exactness with which the incision is made, and the depth of the incision required, owing to the strictured tissue being rendered tense (thinned out) by dilating it prior to cutting. By confining the incision to the strictured portion of the urethra, coupled with the introduction of the soft catheter, the likelihood of extravasation is prevented. If the precautions are taken as advised, to secure thorough asepsis, urethral fever will not occur. Curvature of the penis to a slight extent will follow this operation in a small number of cases, I care not how carefully the operation is done. In this connection I can do no better than refer to the second series of cases, numbering one hundred and eighty-six, reported by Professor F. N. Otis, where incurvation of the penis occurred as follows :

Slight, and lasting for a short time only.....	3
Slight, and lasting for one and a half months	1
Slight, lasting four months.....	1
Slight, lasting one year.....	1
Total.....	6

The treatment that will be found most satisfactory in this complication is massage and the local use of an ointment of mercury and belladonna. By retaining the soft catheter for twenty-four hours following the operation, retention is less liable to occur than if the urine be drawn. Spongio-corporitis I have never had follow the operation, and I believe when it does occur it is the result of faulty antisepsis. By confining the bougie, passed for the purpose of preventing recontraction, to the pendulous urethra, and the observance of strict asepsis, abscess of the prostate gland

will not be met with. The advantage of the dilating urethrotome over all instruments for the internal division of strictures of large calibre of the pendulous urethra are the following : 1, the adaptability to accommodate itself to a stricture of the size between twenty and forty millimetres ; 2, the exactness with which the stricture can be located and divided ; 3, the very small incision necessary for the complete division of the same, being able to render the stricture tense ; 4, being able, without any question of doubt, to divide all strictured bands, the latter qualification particularly not being possessed by any other instrument. The adaptability of the dilating urethrotome to any stricture of the calibre between twenty and forty, holds the same relation to other instruments as does the urethrameter to bulbous bougies,—*i.e.*, that the urethrameter will accomplish what will otherwise require a series of twenty-two bulbous bougies. In addition to being able to locate accurately a stricture in the pendulous urethra of the calibre of eighteen millimetres and above, with the urethrameter, we are able to measure its calibre as well as its length, and by this means determine the length and depth of the incision required to divide it. I would not advise internal urethrotomy in the case of a stricture of large calibre in one the subject of a hemorrhagic diathesis, of advanced kidney-disease, or in one advanced in life. In the case of a stricture of small calibre, where either of the above conditions are present, I do not think it prudent to adopt radical operative means, unless the stricture is the source of much trouble.

If the patient is of a bleeding family, I would simply practise gradual dilatation, but otherwise would divide the stricture under cocaine, believing this preferable, under the above circumstances, to the administration of an anaesthetic. Strictures of small calibre in the pendulous urethra that cannot be dilated to admit the Otis urethrotome, but which will admit the filiform bougie of Maisonneuve's urethrotome, can be divided by this instrument, thus allowing the passage of the dilating urethrotome, when it can be disposed of as an ordinary stricture of large calibre. This I find safe, and much more acceptable to the patient than an external urethrotomy. In all strictures of large calibre, whether made such by the preparatory urethrotomy, with Maisonneuve's urethrotome or not, and situated not deeper than four and a half inches from the meatus in the average-sized penis, and five inches in the unusually large penis, I believe dilating internal urethrotomy to be not only the surest and the most speedy way of treating the same, but the only way that will offer the patient a means of permanent cure.

The operation of perineal section and external urethrotomy can be done in one of several ways, the technique of which depending upon the permeability of the stricture to the passage of an instrument. When the stricture will admit, it is the custom with many surgeons to introduce a guide (Gouley, Symes staff, or, if these be too large, a filiform bougie), in this way facilitating the operation. Should this not be feasible, a medium-sized staff or conical steel sound

is passed down to the face of the stricture, and the urethra opened by cutting down upon the point of the instrument as the guide. The stricture is then divided from before backward. My method of performing perineal section and external urethrotomy for stricture is without a guide, exposing the urethra behind the stricture by a careful dissection, when it is opened and the stricture divided from behind forward. This is undoubtedly a safer method—there being no question about finding the urethra if we are perfectly familiar with the anatomy of the part operated upon (which I maintain every surgeon should be)—than to cut down, being guided by so small an instrument as a Gouley, Symes staff, or a filiform bougie, engaged, as it is thought, in the stricture, but as likely to be in a false passage. Is not the recognition of the tissues a more reliable guide? Exceptions may be taken to the above when the perineum is extensively infiltrated with urine. I recall a case of traumatic stricture of the membranous urethra following a fracture of the ramus of the ischium, the result of direct force, which I operated upon in the University Hospital two years ago. I am quite sure, if I had not operated in this way I would not have succeeded without at least endangering the life of my patient. This case made a speedy recovery, not having had a bad symptom. The urethra being opened and the stricture divided, a soft catheter is introduced into the bladder through the urethrotomy wound and retained. A drainage-tube, full size, is passed through the urethra to the urethrotomy wound, where it is brought out;

this, with the catheter in the bladder, is allowed to remain four days. By means of the catheter and the drainage-tube, both bladder and urethra are kept aseptic by frequent and thorough irrigation of a solution of bichloride of mercury, 1 to 15,000. After the removal of the catheter and the drainage-tube, the treatment consists in passing a conical steel bougie of the calibre of the urethra through the meatus to beyond the stricture every third day till repair is complete.

The terms perineal section and external urethrotomy have distinct meanings, the former referring to a section of the urethra made from without and posterior to the perineo-scrotal junction, the latter to a section of the urethra anterior to this point. The only complication of any moment in a perineal section or external urethrotomy is hemorrhage, which, I believe, is less likely to occur when the operation is done by dissection, this enabling the operator to see and tie all bleeding points. In the event that the bleeding continues after the operation is completed and the patient put to bed, it can, in the majority of cases, be controlled by packing. Yet I recall one case where there was internal bleeding (into the pelvis), notwithstanding the above precautions were taken. What is the explanation of blood finding its way into the pelvis? So long as the membranous urethra is not trespassed upon, there is no danger of bleeding taking place into the pelvis, blood being prevented from finding its way there by the attachment of the anterior layer of the triangular ligament (deep perineal fascia.) When the space between the anterior and the posterior layer

of the triangular ligament is opened up, as must of necessity be done when dividing a stricture of the membranous urethra, a communication is established between the muscles (levator ani coccygeus and pyriformis), forming the floor of the pelvis and the pelvic fascia, which latter is continuous with the posterior layer of the triangular ligament (deep perineal fascia). The case above referred to was one of stricture of the bulbomembranous junction, for which I did a perineal section some years since, and where hemorrhage took place into the pelvis, forming a blood clot most pronounced in front of the bladder ; the clot underwent suppuration, causing septicæmia, from which the patient did not recover for three months.

CASE I.—*Internal Urethrotomy.*—J. H., white, aged 32, was admitted to the male venereal wards of the Philadelphia Hospital, complaining of difficult micturition. Gave a history of several attacks of gonorrhœa. The stream of urine passed was small, and there was a gleety discharge. Examination of urine was negative. A No. 20 F. conical steel bougie could be passed with some difficulty, occasioning patient considerable pain.

Examination of the urethra with the urethrometer showed its calibre to be forty millimetres, calibre of the meatus twenty-eight millimetres, and the presence of three strictures, respectively, three-quarters, two and a half, and three inches posterior to the meatus. The patient giving his consent to an operation, 10 grains of boric acid t. d. was given internally for five days previous to the operation. On October 4, 1889, he was

brought before the clinic, and 10 grains of quinine were administered; was anæsthetized, ether being used. The first procedure was the restoration of the meatus to the calibre of forty millimetres. Having located the anterior stricture, I then passed the Otis dilating urethrotome, so as to engage it, and dilated it until it met with resistance. The concealed blade was then drawn through the stricture. After division, was able to expand the blade up to forty millimetres, the normal calibre of the urethra. This procedure was repeated with each of the remaining strictures in turn. Having divided these, I then introduced the urethrameter down to the bulbo-membranous junction, when it was expanded to forty millimetres, and then easily withdrawn, all obstructive points having been divided. The urethra was washed out with a 1 to 15,000 solution of bichloride, a soft catheter introduced into the bladder, which was allowed to remain for twenty-four hours. Before removal from the operating-table a one-grain opium suppository was introduced. His recovery was uninterrupted, the temperature at no time reaching 99°. A No. 40 F. bougie was passed every fourth day for four weeks, when, there being no longer any discharge, the patient was discharged cured.

CASE II.—*Internal Urethrotomy*.—S. S., transferred from the nervous to the surgical wards of the Philadelphia Hospital on September 16, 1889, with the diagnosis of stricture. Had gonorrhœa fifteen years ago. For the last three years noticed his stream decreasing in size. When admitted to the nervous ward a No. 15 F. bougie could with

difficulty be passed. When referred to the surgical ward his urethra was gradually dilated, until a No. 21 F. bougie could be introduced.

*Measurements.*—Circumference of penis, three and three-quarter inches; calibre of urethra, thirty-five millimetres; of meatus, twenty-three millimetres; of stricture, twenty-one millimetres; depth, three inches from the meatus.

He was prepared by the routine administration of boric acid internally, 10 grains t. d. Previous to the operation 10 grains of quinine sulph. and  $\frac{1}{2}$  grain of morphine sulph. were given.

*Operation, September 25.*—Stricture cut as in Case I. Temperature before operation,  $99\frac{1}{2}^{\circ}$  F.; after operation, evening,  $98\frac{1}{2}^{\circ}$  F.

The night following the operation the patient removed the catheter; his temperature rose to  $101\frac{1}{2}^{\circ}$ ; catheter was reintroduced under antiseptic precautions; quinine was administered. After this his temperature dropped to 101, and on the morning of September 26 was  $98\frac{1}{2}^{\circ}$ . On the evening of the 26th the catheter was again removed by the patient, his temperature rising to  $101\frac{1}{2}^{\circ}$ ; was treated as on former occasions. After this no difficulty was experienced. One month after the operation a No. 36 F. bougie could be passed with perfect ease.

**CASE III.—*Internal Urethrotomy.***—S. T., white, aged 47, a hemiplegic, was transferred from nervous to surgical ward of the Philadelphia Hospital for urethral treatment. The examination revealed as follows: Circumference of penis, three and a half inches; calibre of

urethra, thirty-four millimetres ; of meatus, thirty millimetres. One stricture was found three inches from the meatus. The patient had some difficulty in urinating, but not a great deal ; complained chiefly of reflex symptoms, which were thought to be due to the condition of the urethra. The patient having been prepared as in Case I., and the stricture and meatus divided in the same manner, a No. 34 F. sound was passed through the stricture without any difficulty. A catheter was passed into the bladder and secured. An opium suppository introduced into the rectum and patient returned to bed. Same after-treatment given as in the two previous cases. Four weeks after the operation recovery complete.

CASE IV.—*Interno-External Urethrotomy.*  
—J. W., aged 42, white, was admitted into the venereal ward of the Philadelphia Hospital suffering from periodical attacks of retention of urine, with a history of having had several attacks of gonorrhœa and a stricture. Had external urethrotomy performed some time since ; the wound was entirely healed at time of entrance into the hospital. On examining the case, a cicatrix was found in the perineum, corresponding to the site of the former operation.

*Measurements.*—Circumference of penis, three and a half inches. Examination by the urethrameter gave a urethral calibre of thirty-three millimetres ; meatus, twenty-eight millimetres ; and the presence of two strictures in the pendulous urethra, situated two and a quarter and four inches posterior to the meatus, of the calibre of twenty-eight

and twenty-six millimetres, respectively. The calibre of the stricture in the deep urethra was not measured.

I explained the condition of affairs to the patient, and advised radical treatment, to which he gave his consent. An examination of the urine was negative. Boric acid was given internally for four days previous to the operation. The patient received 10 grains of quinine sulph. prior to the administration of ether. The strictures in the pendulous urethra was disposed of as in Cases I., II., III. I then divided the stricture in the deep urethra by perineal section. The incision began at the junction of the scrotum and perineum, and was continued backward about two inches, taking as my guide the perineal raphe, going through the cicatricial tissue resulting from the former operation. I found the landmarks in this case entirely obliterated ; the perineum was infiltrated by the products of inflammation. Cutting through the cicatricial tissue, being careful not to deviate from the median line, I readily exposed the urethra behind the stricture, which was opened and the stricture divided. An ordinary aseptic drainage-tube was passed through the pendulous urethra, and brought out at the perineal wound. A catheter was introduced into the bladder from the perineal wound, and held in position by a suture ; the pendulous urethra and bladder were flushed with a 1 to 15,000 bichloride solution ; the free ends of the drainage-tube were fastened together with a safety-pin. Iodoform was freely used in the perineal wound, which was then packed with iodoform gauze, an opium suppository

introduced into the rectum, and an antiseptic dressing applied. Patient returned to bed. The packing was allowed to remain for three days; when removed, the wound was free from pus and aseptic, the urethra and bladder were irrigated, and the drainage-tube and catheter removed; a No. 33 F. bougie was passed. This was repeated every third day until the wound in the perineum was entirely healed, which required six weeks, the drainage-tube and catheter only remaining in three days. Patient left the institution cured.

CASE V.—*External Urethrotomy*.—W. J., aged 17, white, was admitted to the surgical ward of the Philadelphia Hospital suffering from retention of urine. Gave a history of having fallen astride a rail when thirteen years of age. On entrance to the hospital an attempt to pass a catheter by my resident failed. Neither was he able to pass a filiform bougie. Failing myself to pass an instrument, I had the patient etherized. Under the influence of the anæsthetic I succeeded in passing a No. 12 conical steel bougie, French scale. As the patient desired permanent relief, and the stricture (traumatic) was situated in the deep urethra, I performed perineal section. An incision, beginning at the junction of the scrotum with the perineum, was carried back in the median line or the perineal raphe for two and a half inches, when, by a careful dissection through the deep structures, the urethra, which was infiltrated to a considerable extent with inflammatory material, was exposed. A small opening was now made in the urethra, through

which a grooved director was passed into the bladder, from which passed a large amount of urine. The opening in the urethra was extended anteriorly through the stricture. A sound, No. 40 F., could now be passed through the urethra and into the bladder. From the perineal wound a catheter was passed into the bladder, which was held in place by a suture; a drainage-tube passed through the urethra; the wound thoroughly irrigated, dusted with iodoform, and packed with iodoform gauze; a suppository of 10 grains of quinine and 1 grain of opium was introduced into the rectum, the wound dressed antiseptically, and the patient placed in bed. The dressing was allowed to remain for four days, when the packing with the catheter was removed, and both wound and bladder thoroughly irrigated with a solution of boric acid. A sound, No. 40 F., was passed with the same ease as at the time of the operation. The wound was again lightly packed and dressed antiseptically. The patient was dressed every three days, and a No. 40 F. bougie passed at the time of the dressing. Five weeks and three days after the operation the wound in the perineum had entirely healed. There was no difficulty experienced in passing a 40 F. bougie. The patient was discharged cured.



